

More Multiplication Properties of Exponents Notes

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Power of a Power

$$(a^m)^n = a^{mn}$$

Power of a Product

$$(ab)^m = a^m b^m$$

Sample Problem 1: Simplify the following expressions.

1. $(x^2)^3 = x^6$

2. $(2^2)^3 = 2^6 = 64$

3. $(ab)^3 = a^3 b^3$

4. $(2x)^2 = 2^2 x^2 = 4x^2$

Sample Problem 2: Evaluate the following using properties of powers.

5. $ab^3(a^2b)^4 = ab^3(a^8b^4) = a^9b^7$

6. $(3x)(2x)^2 = (3x)4x^2 = 12x^3$

7. $-4^2(ab^2c^3)^3 = -16a^3b^6c^9$

8. $(4v^3)^2(2v^3)^3 = 16v^6(8v^9) = 128v^{15}$

9. $2x^3y^2(3x^{-2}y^{-1})^3 = 2x^3y^2(27x^{-6}y^{-3}) = 54x^{-3}y^{-1}$
 $= \frac{54}{x^3y}$

10. $\left(\frac{2x}{y}\right)^3(3x)^2 = \frac{8x^3}{y^3}(9x^2) = \frac{72x^5}{y^3}$